

## Memorandum

TO: Administrator Pruitt

FROM:

CC:

RE: Meeting with Siemens

DATE: June 27, 2017

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**PURPOSE:** Purpose of meeting is no asks simply introductions. Siemens would like to share information on its investments in the US. The members of Siemens Managing board are hoping to gain insights into Administration's priorities as related to energy and the environment – direction of policies that could impact their US business, and how that then fits into the global market. Siemens' portfolio includes power plants and power-generating equipment, turbines for use as mechanical drives, compressors for industrial applications, power transmission and distribution systems, smart grid applications, and related instrumentation and control systems, and renewables. In this case, specifically the priorities of the Administrator – how he sees things moving forward. Siemens looks through the lens not only re: our own business but that of our customers from oil and gas E&P, pipelines, offshore, and wind. Siemens has a large core of oil and gas customers. They will raise the methane rules for oil and gas wells.

### BIOGRAPHY:



**Lisa Davis**

Member of the Managing Board, Siemens AG

Lisa Davis is a member of the Managing Board, Siemens AG and serves as chair and CEO of Siemens Corporation USA. She is responsible for Power and Gas, and Power Generation Services Divisions.



**Cedrik Neike**

Member of the Managing Board, Siemens AG

Cedrik Neike is a Member of the Managing Board of Siemens AG. He is responsible for the Energy Management Division and Asia and Australia regions.



**Michael Sen**

Member of the Managing Board, Siemens AG

Michael Sen is a Member of the Managing Board of Siemens AG. He is responsible for Siemens Healthineers, Siemens Gamesa Renewable Energy and Global Services.



**Dr. Ralf P. Thomas**

Chief Financial Officer and Member of the Managing Board, Siemens AG

Ralf P. Thomas is Chief Financial Officer and Member of the Managing Board, Siemens AG, responsible for Finance and Controlling and Financial Services.



**Liz Reicherts**

Head of Government Affairs, Siemens USA

**Company:** Siemens USA is a U.S. subsidiary of Siemens AG, a global technology company. In 2016, Siemens USA generated \$23.7 billion in revenues (including \$5.4 billion in exports), and employed 50,000 workers at more than 60 facilities around the country. Additionally, the company spent \$1.11 billion on R&D.

**Topics for Discussion:**

**Deliberative Process / Ex. 5**

**Deliberative Process / Ex. 5**

# SIEMENS

## Siemens in the U.S.

Siemens USA is a U.S. subsidiary of Siemens AG, a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for nearly 170 years.

The company is using its global leadership in engineering and technology innovation to meet America's toughest challenges. From efficient power generation to digital factories, from wellhead to thermostat, and from medical diagnostics to locomotives and light rail vehicles, Siemens in the United States delivers solutions for industry, hospitals, utilities, cities and manufacturers. Siemens' next-generation software is used in every phase of product development, enabling manufacturers to optimize and customize equipment that touches American lives every day.

Siemens has been in the U.S. for more than 160 years and it is now the company's largest market. In just the past 15 years, Siemens has invested approximately \$40 billion in America. Most recently, Siemens expanded its digital industrial leadership with the acquisition of Oregon-based software company, Mentor Graphics.

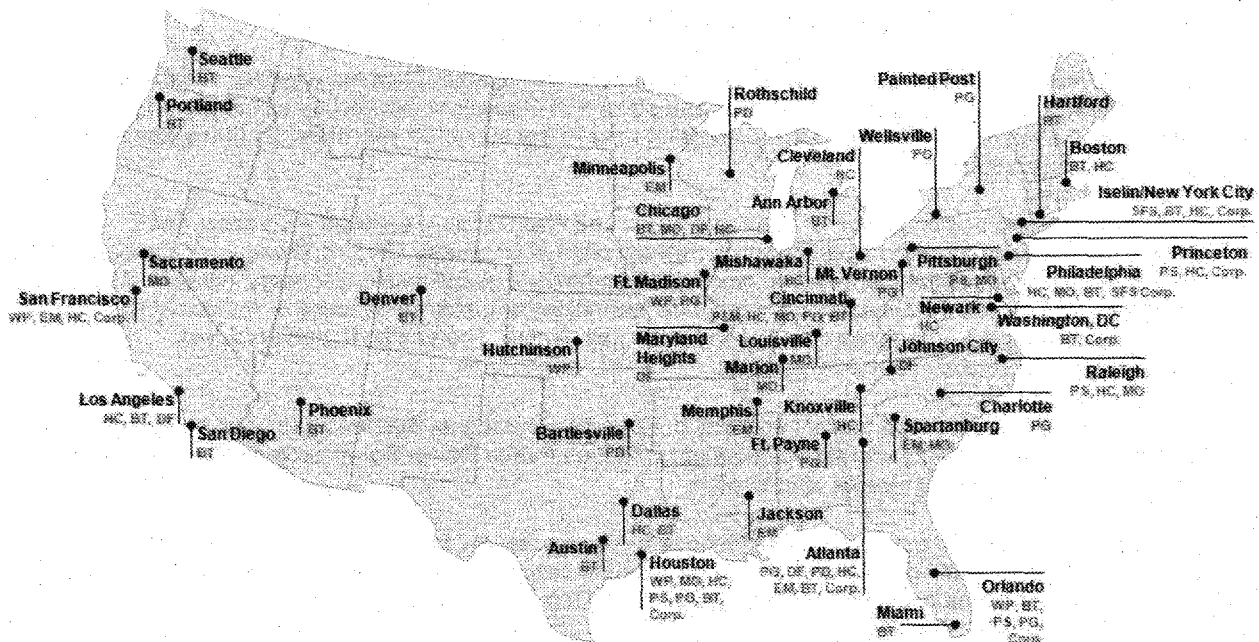
With 351,000 employees in more than 190 countries, Siemens reported worldwide revenue of approximately \$88.1 billion in fiscal 2016. Siemens in the U.S. reported revenue of \$23.7 billion, including \$5.4 billion in exports, and employs approximately 50,000 people throughout all 50 states and Puerto Rico.

Siemens is home to more than 60 manufacturing sites in the U.S. The company invests more than \$1 billion in R&D annually and more than \$50 million in job training programs.

U.S. Fast Facts FY2016*	
<b>Revenue (direct business)</b>	\$23.7 billion (including \$5.4 billion in exports)
<b>New Orders (direct business)</b>	\$24.4 billion
<b>Employees**</b>	50,000
<b>R&amp;D Expenditures</b>	\$1.11 billion
<b>R&amp;D Employees**</b>	5,700
<b>Manufacturing Sites</b>	More than 60
* All data reported as "Continuing Operations"	
** Number of employees is approximate	

For Siemens, the U.S. is also an extremely vital production location, one of the most important research centers, and a key base from which Siemens exports globally.

## Siemens' Major U.S. Employment Hubs



Updated as of 4/27/2017

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An overview of Siemens' divisions, its core businesses and other U.S. recognition:

## POWER & GAS

For over a century, Siemens has set the standard for excellence in power generation, transmission and distribution. Siemens continues to build on that proud tradition, using engineering expertise and global leadership in technology to provide innovative solutions for U.S. customers – from utilities, to the industrial space, to oil and gas companies. For power generation and delivery, Siemens' portfolio includes power plants and power-generating equipment, turbines for use as mechanical drives, compressors for industrial applications, power transmission and distribution systems, smart grid applications, and related instrumentation and control systems.

Siemens Power and Gas hub for the Americas is based in Orlando, Florida, and its global Oil & Gas Headquarters is located in Houston, Texas – serving the global Oil & Gas sector from the "Energy Capital of the World". Siemens has major manufacturing and service operations across the U.S., including the Charlotte Energy Hub, which manufactures and services advanced fossil power generation equipment, such as gas and steam turbines and generators; a steam turbine plant in Burlington, Iowa; and factories in New York state that produce steam turbines and compressors.

Through the 2015 acquisition of Dresser-Rand and the 2014 acquisition of the Rolls-Royce Energy aero-derivative gas turbine and compressor business, Siemens is positioned as the most complete, end-to-end rotating equipment and process automation provider in the market. By combining expertise in automation, electrical systems, data analytics, and service with these established providers, Siemens is able to offer a much broader range of products, services and solutions to meet customer needs – particularly in the oil and gas industry and in the field of distributed generation.

### *Examples of major business:*

- With the U.S. in the midst of an energy revolution, Siemens is the technology partner for the Holland Energy Park – a community-based initiative in Holland, Mich., to construct a modern and efficient natural gas combined cycle power plant. Holland Energy Park will harness clean-burning, low-cost American natural gas to benefit its customers, cutting greenhouse gas emissions by about half. For this innovative project, which will also expand Holland's downtown snowmelt system, Siemens is supplying two SGT-800 gas turbines and one SST-400 steam turbine, low and medium voltage power equipment, as well as a long-term service contract for the gas turbines.
- As part of the trend toward decentralized energy in the United States, Siemens provided Wesleyan University with an innovative combined heat and power (CHP) system that serves as the primary heat source for the university's athletic facility – helping to save the school an estimated \$1,000 a day from lower gas and electricity usage.
- The Dresser-Rand business, part of Siemens Power and Gas Division, supplied a Guascor gas engine for use in an advanced gasification bioenergy plant at Lockheed Martin's Owego, NY, facility – powering operations at the plant and advancing the company's global waste-to-energy initiative. The advanced gasification system uses Concord Blue technology to gasify wood chips or municipal solid waste, converting the organic waste into fuel for the gas engine. The engine in turn produces electricity that is used to offset energy costs.
- As America continues to turn to cleaner-burning, low-cost natural gas, Siemens has been selected to deliver world-class power generation equipment for seven Panda Power Funds projects since 2012 – with sites in Texas, Pennsylvania, and Virginia.
- The Dresser-Rand business delivered power generation equipment for a combined cycle power plant for the Shell Appomattox deep-water oil and gas floating production platform. The platform will be located 80 miles off the coast of Louisiana in the Gulf of Mexico and is slated to start production around the end of this decade.

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- To help ensure grid stability in New York City, Siemens is filling an order from Macquarie Infrastructure Corporation for the installation of additional aeroderivative gas turbines for the Bayonne Energy Center (BEC) in New Jersey. BEC delivers power through a dedicated 6.5 mile long underwater transmission cable to the Consolidated Edison Gowanus substation in Brooklyn to meet the electricity needs of over 500,000 homes and businesses in New York City. With aeroderivative technology, the flexible BEC plant can produce full power from a standing start in less than ten minutes of receiving a request from the power distributor.

## **SIEMENS GAMESA RENEWABLE ENERGY**

Siemens Gamesa is the separately managed wind business of Siemens AG. Siemens Gamesa is a leading supplier of reliable, environmentally-friendly and cost-efficient renewable energy solutions. Driving down the cost of wind power is Siemens' key target as we strive to make renewable energy fully competitive with conventional energy sources. With nearly 6,000 wind turbines installed in the United States – capable of producing clean, renewable power for more than 4.2 million households every day – Siemens provides highly reliable and cost-efficient wind turbines to meet both business and environmental needs. In the U.S., Siemens manufactures wind turbine blades at a factory in Fort Madison, Iowa, and assembles nacelles and rotors at a production site in Hutchinson, Kansas. Siemens has a wind turbine R&D competence center in Boulder, Colorado.

For the wind power sector, Siemens currently provides service and maintenance for more than 3,200 installed wind turbines in the U.S. and more than 9,900 globally. In 2013, Siemens opened a state-of-the-art Wind Service Training Center in Orlando, a hub that provides highly advanced technical and safety training for installation and service technicians working at wind energy projects located throughout the Americas.

### ***Examples of major business:***

- Designed largely at Siemens' aerodynamic engineering center in Colorado, the new SWT-2.5-120 turbine will be produced at Siemens' factories in Iowa and Kansas starting in 2017. The new blade was designed with the goal of increasing energy production for sites with medium to low wind conditions, which currently comprise much of the U.S. market.
- Siemens Gamesa provided MidAmerican Energy with 448 wind turbines for five wind projects in Iowa. With a total capacity of 1,050 megawatts (MW), this represents the largest order for onshore wind turbines for Siemens in the U.S.
- In 2014, Siemens Gamesa signed a long-term service agreement with MidAmerican Energy to provide service and maintenance for 958 SWT-2.3 turbines at 12 wind projects in Iowa. Combined, these 12 wind projects have the capacity to generate more than 2.2 GW, enough to provide approximately 665,000 average U.S. homes with clean energy.
- Siemens Gamesa recently completed an order from Pattern Energy Group Inc. to supply, support installation and provide long-term service for 65 wind turbines for the Amazon Wind Farm located near Fowler, Ind.
- In an effort to use innovation to expand wind power in the U.S., Siemens Gamesa introduced a concrete wind turbine tower technology that is designed to capture stronger winds at higher altitudes – resulting in more potential energy production and increased project revenue for customers. Siemens developed this concrete tower technology through prototype testing in Texas and a subsequent single commercial turbine in Iowa.

## **POWER GENERATION SERVICES**

With a broad spectrum of innovative products and services, Siemens has developed a number of

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advanced, data-driven service offerings that combine big data with the company's comprehensive domain expertise to support its industrial, oil and gas, and electric utility customers, ensuring reliability and optimal performance. Siemens' extensive national network of service technicians is able to quickly and comprehensively offer expert service to maximize the lifecycle of power generation equipment, helping to ensure reliability and prevent downtime.

With a global headquarters in Orlando, Florida, Siemens continually looks for ways to increase the performance of customers' operating plants. The Siemens Power Generation Services Division has been advancing the development of digital trends, building upon its more than 20 years of experience collecting and analyzing data as part of its power diagnostics services. Through digitalization and other advanced technologies, Siemens can increase the efficiency and capacity of existing power plants, enabling them to generate substantially more electricity with the same amount of fuel, which pays off both economically and environmentally.

## ***Examples of major business:***

- The acquisition of Dresser-Rand and Rolls-Royce's former energy business has already expanded the installed base of Siemens products in the energy business by around 100,000 units to more than 140,000 units in fiscal 2015. From the end of fiscal 2014 to the end of the first half of fiscal 2016, the order backlog at Power Generation Services had grown by 28 percent.
- In addition to delivering world-class power generation equipment for seven Panda Power Funds natural gas-fired power plants since 2012, Siemens also provides long-term service for these projects, with sites in Texas, Pennsylvania, and Virginia.
- In 2015, Siemens was awarded a long-term service contract for gas turbines at the new Holland Energy Park combined cycle power plant in Holland, Mich. This forward-leaning energy project, slated for commercial operation in 2017, provides sustainable power while also bolstering the city's innovative snowmelt system and serves as a model for how a community can address its power generation needs.

## **ENERGY MANAGEMENT**

Siemens Energy Management helps to manage the power chain from creation to consumption, providing technologies for the economic, reliable and intelligent transmission and distribution of electrical power. Across the low-voltage and distribution power grid level, Siemens designs and manufactures smart grid and energy automation technology, power supply for industrial plants, and high-voltage transmission systems. In the U.S., Siemens is providing intelligent technologies to customers including Microsoft, California Independent System Operator, American Electric Power, Con Edison, Hudson Transmission Partners, and Holland Energy Park. Siemens has manufacturing hubs in Jackson, Miss.; Wendell, N.C.; Spartanburg, S.C.; Grand Prairie, Texas; Pomona, Calif.; Ft. Worth, Texas; and Heber Springs, Ark.

## ***Examples of major business:***

- Siemens is providing Con Edison, the utility that powers New York City and local areas, with six mobile resiliency transformers to help replace units within days rather than weeks in times of extreme weather like hurricanes or other major substation events. The mobile resiliency transformers will allow Con Edison to respond to these events where multiple transformers may be impacted and normal spares or system redundancy may not be able to address the issues. Con Ed also chose Siemens to provide its meter data management platform to support the utility's smart meter deployment initiative.
- Blue Lake Rancheria, a Native American reservation in Northern California, and Humboldt State University's Schatz Energy Research Center are partnering with Siemens to build a low-carbon community microgrid. The company's microgrid management software will enable the Rancheria to manage and operate on-site clean power generation sources, including a biomass plant, fuel

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cell, battery storage and diesel generators to power the 100-acre reservation and keep electricity flowing to critical sites, such as the Red Cross Safety Shelter, in times of extreme weather.

- California ISO is relying on Siemens software to operate its growing Energy Imbalance Market (EIM). Siemens software is a key component of the EIM system that allows the ISO to analyze the energy requirements of the grid every five minutes and automatically determine the lowest-cost generation to meet demand while maintaining the security of the grid.
- Holland Energy Park will depend on critical low and medium voltage power equipment from Siemens to help power its new combined cycle power plant in Holland, Mich. The local municipal utility, Holland Board of Public Works, is replacing an aging coal-fired plant with a new fuel efficient modern power plant, slated for commercial operation in fall 2016. Siemens will also be providing gas and steam turbines for the plant that will use waste heat from the circulating water system for use in an expanding downtown snowmelt system.

## **BUILDING TECHNOLOGIES**

Energy efficiency is no longer just measured through "greenness" but now also through "intelligence." Technology and data-based services are helping cities – as well as major campuses, enterprises, hospitals and data centers – monitor energy usage and integrate building automation solutions for enhanced energy efficiency, reliability, and safety. Siemens' Building Technologies (based outside of Chicago in Buffalo Grove, Ill.) is the North American market leader for safe and secure, energy-efficient and environmentally-friendly buildings and infrastructure. As a technology partner, service provider and system integrator, Building Technologies has offerings for fire protection, life safety and security as well as building automation, heating, ventilation and air conditioning (HVAC), and energy management. Since 1995, Siemens has helped modernize nearly 7,000 buildings worldwide, highlighted by the world's tallest green skyscraper, in Taipei, and important American landmarks such as the new World Trade Center Memorial, the Times Square building, Carnegie Hall, Walt Disney World and the Mount Vernon estate.

### ***Examples of major business:***

- The **Louisiana Stadium and Exposition District (LSED)** and Siemens are working together to implement technological advancements and energy efficiency upgrades at the Mercedes-Benz Superdome. The recently completed performance contract, which was structured at no initial cost to the LSED, provides improvements to the stadium's lighting, temperature systems, and energy management platform. This project will not only result in cost savings, but will also provide a better experience for fans, players, and performers.
- Under a 15-year performance contract, Siemens has begun working on infrastructure improvements for **Orem, Utah**. Expected to save the city an estimated \$11.4 million in energy and operational cost savings and capital cost avoidance, the initial project phase of this performance contract will allow Orem to use new technologies to make necessary capital improvements to meet the needs of its growing population.
- Siemens has implemented an integrated physical security solution throughout **Port Manatee** in Tampa Bay, Fla., the closest U.S. deep-water seaport to the Panama Canal. The system combines access control and physical security infrastructure management technologies, allowing the port, which moves approximately 8 million tons of cargo annually, to streamline its processes and increase efficiency by enabling officials to track the movement of goods.
- Siemens is the technology partner and infrastructure provider for **Sterling Ranch**, located on 3,400 acres in Colorado. Once it's fully developed, the sustainable, mixed-use, master-planned community will be home to 12,050 housing units, 2 – 3 million square feet of commercial space, and more than 1 million square feet of institutional space. Siemens' Intelligent Infrastructure Solutions (I2S) will combine a comprehensive command control and communication for their



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buildings' physical infrastructure; data-driven intelligence and advanced facility-related analytics; and regular service of all components throughout the buildings' and infrastructure's lifecycle.

## **MOBILITY**

Siemens Mobility provides efficient and integrated technologies, products and services to enable the safe and reliable transportation of people and goods by rail and road. Siemens designs and manufactures across the entire spectrum of rolling stock, including commuter and regional passenger trains, light rail and streetcars, metros, locomotives, passenger coaches and high-speed trainsets. In the U.S., Siemens provides rail vehicles, locomotives, components and systems to more than 25 agencies in cities such as Washington D.C., New York, Boston, Seattle, Philadelphia, Denver, Salt Lake City, Minneapolis, Houston, Portland, Sacramento, San Diego, St. Louis, Atlanta and Charlotte. Cities also rely on Siemens to provide traction-power substations and electricity transmission, as well as signaling and control technology for freight and passenger rail and transit systems. Siemens has transportation manufacturing hubs in: Sacramento, Calif.; Louisville, Ky.; Marion, Ky.; and Pittsburgh, Pa.

### ***Examples of major business:***

- Siemens has been manufacturing rail vehicles in Sacramento for more than 30 years. In 2016, the 1,000-person plant completed its first full high-speed trainset for Brightline, the new high-speed service that will connect Miami and Orlando. The plant is manufacturing new clean diesel-electric locomotives for several state DOTs in the Midwest, West and East; light rail vehicles for many cities, including for San Francisco, Siemens' largest light rail vehicle contract ever in the U.S.; and new electric locomotives for the Southeastern Pennsylvania Transportation Authority. Siemens was also recently chosen to build new light rail vehicles for Seattle, the largest contract in Sound Transit history, San Diego, the Twin Cities, and new advanced technology streetcars for Charlotte.
- Siemens, as a member of the Tampa-Hillsborough Expressway Authority (THEA) team, has been chosen by the U.S. Department of Transportation (DOT) to provide innovative vehicle-to-infrastructure (V2I) technology for Tampa's new Connected Vehicle pilot project. Siemens V2I technology will enable vehicles and pedestrians to communicate with traffic infrastructure such as intersections and traffic lights in real-time to reduce congestion, specifically during peak rush hour in downtown Tampa. The technology will also significantly help improve safety and reduce greenhouse gas emissions. This is one of three projects funded by the USDOT to pilot next-generation technology in infrastructure and vehicles that can impact unimpaired vehicle crashes, which make up 80 percent of the crashes on the road.
- The Sacramento Regional Transit District (RT) is operating newly-refurbished light rail vehicles by Siemens on its Blue Line. The vehicles will increase capacity on the line and throughout the RT light rail system in order to maintain service levels. Siemens has refurbished a total of 21 vehicles for Sacramento RT that will add approximately 15 years of additional useful life to the vehicles.
- Siemens has been chosen by the Metropolitan Transportation Authority (MTA) to install Communications-Based Train Control (CBTC) on the Queens Boulevard Line, one of the busiest subway lines on the New York City Transit system. The radio-based CBTC technology provides real-time data on vehicle position and speed conditions, allowing system operators to safely increase the number of vehicles on a rail line. This results in greater frequency of train arrivals and allows MTA to accommodate more passengers on its system. In addition to the new system on the Queens Boulevard line, Siemens successfully installed CBTC technology on the Canarsie "L" line that has allowed MTA to handle and sustain increasing ridership on the line over the last 20 years.
- Ann Arbor, MI has been named by Siemens as the company's First Center of Excellence for Intelligent Traffic Technologies and will provide the city with the latest innovative hardware and

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software technology to help expand the city's smart traffic infrastructure. Siemens' technology and updates to Ann Arbor's existing traffic systems will help improve the commute, game day, and travel experience. These systems will allow Ann Arbor to respond and adapt more quickly and intelligently, in real-time, to improve traffic flow and safety.

## DIGITAL FACTORY

Siemens Digital Factory offers a comprehensive portfolio of seamlessly-integrated hardware, software and technology-based services to support manufacturing companies worldwide in enhancing the flexibility and efficiency of their manufacturing processes and reducing the time to market of their products.

Siemens PLM Software, a business unit of the Siemens Digital Factory Division, is a leading global provider of product lifecycle management (PLM) and manufacturing operations management (MOM) software, systems and services with over 15 million licensed seats and more than 140,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with its customers to provide industry software solutions that help companies everywhere achieve a sustainable competitive advantage by making real the innovations that matter.

### ***Examples of major business:***

- To achieve a shorter time to market without sacrificing quality and to meet market demands, sports car manufacturer Maserati went digital and worked with holistic manufacturing solutions, choosing Siemens to cover their entire industrial value chain. Siemens supports Maserati along the complete product development and production process from product design to production planning, engineering, production execution and services. Through efficiently merging the virtual and real worlds, the Italian automobile manufacturer reduced its development time by 30 percent and tripled its production.
- Ford Motor Company Powertrain implemented Siemens Digital Enterprise solutions to improve its manufacturing process. Ford is using Teamcenter to create a "digital thread" from product development through manufacturing, reducing development times by up to 40 percent. Ford is one of the very few automakers that has a direct connection between development information and the product in service. The Teamcenter-based "In Vehicle Software Management" (or IVS) solution is able to identify the exact software configuration on any vehicle while in service at the garage, allowing a very cost efficient update of a vehicle's software. This solution eliminated the need for replacement of processing units and allowed Ford to save over 100 million dollars in three years of operation.
- Siemens partnered with Kia Motor Manufacturing Plant of Georgia in September 2016 for a community and industry event. At the event, DF, in partnership with a local distributor, AWC, Inc., announced the donation of \$100,000 in automation hardware and expert training to support career pathways in manufacturing and engineering at the THINC College & Career Academy located in LaGrange.
- Republic Services, Inc., an industry leader in U.S. recycling and non-hazardous solid waste, recently opened its Southern Nevada Recycling Center in North Las Vegas, a \$37 million facility that is the largest and smartest residential recycling center in North America, and capable of processing 70 tons of recyclable material per hour. Siemens, in partnership with CP Group, a leader and supplier of automated turn-key processing and sorting systems for material recovery facilities, provided automation solutions with advanced functionality, yielding high levels of productivity, efficiency, sustainability, reliability and safety.
- Stratasys Ltd. (Nasdaq:SSYS) and Siemens entered a formal partnership to integrate Siemens' Digital Factory solutions with Stratasys' additive manufacturing solutions. The partnership lays the foundation for the two companies to fulfill their shared vision of incorporating additive manufacturing into the traditional manufacturing workflow, helping it to become a universally

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recognized production practice which can benefit multiple industries, including aerospace, automotive, transportation, energy and industrial tooling.

- Siemens and IBM will integrate IBM's Watson Analytics and other analytics tools, powered by Cognos Analytics, into MindSphere, the cloud-based Siemens operating system for the Internet of Things. MindSphere enables industrial enterprises to improve the efficiency of systems through the acquisition and analysis of large quantities of production data.
- To achieve a distinctive marriage of form and function, **Black Diamond Equipment**, a world leader in climbing, skiing and mountain gear, relies on NX™ computer-aided design (CAD) software from Siemens PLM Software. The advanced modeling and design capabilities of NX software help the company engineer lightweight performance into a diverse product line. Top athletes and novices alike trust their lives to Black Diamond's products, which inspire confidence with their engineered styling and ergonomics.
- **Firewire Surfboards**, founded by expert surfers in 2005 and headquartered in Carlsbad, California, produces leading-performance boards, and maintains a competitive advantage through the use of innovative materials and construction techniques. NX™ software, a computer-aided design and manufacturing (CAD/CAM) solution from Siemens PLM Software, has helped Firewire revolutionize surfboard design and production. NX software has helped Firewire dramatically improve design and production efficiency and get its surfboards to market more quickly by enabling them to create re-usable design templates that reduce design time for each board from two hours to less than five minutes. The precise geometry is used to create numerical control programs for efficiently machining the components.
- As the golf club industry moved toward an engineering centric approach for golf club design, it accelerated the rate of new product introduction and challenged companies to speed up design processes. For instance, in just the last few years, the lifecycle of a golf club at **Callaway Golf** has gone from two to three years to 10 to 16 months. As a result, the company needed a software platform that would enable it to design, prototype and test products quickly and precisely. Callaway turned to Siemens PLM Software to provide the tools to meet these challenges. Designers use NX™ CAD software to dream up more complex clubs; engineers use NX CAE to analyze club face thickness; machinists use NX CAM to make push-button prototypes, and they all use Teamcenter® software to manage the entire process.

## *Siemens PLM software highlights:*

- No less than 18 of the top 20 aerospace and defense OEMs use solutions from Siemens PLM Software.
- All of the top 20 aircraft engine manufacturers use solutions from Siemens PLM Software.
- Siemens PLM Software is now used by 29 of the world's top 30 automotive OEMs.
- Nearly 85 percent of the top 50 Tier One auto suppliers use solutions from Siemens PLM Software.
- Seven of the leading shipbuilders in the world use solutions from Siemens PLM Software to create "Digital Shipyards" and three more digital transformations are underway.

## **PROCESS INDUSTRIES & DRIVES**

Siemens Process Industries & Drives helps customers increase productivity, safety, reliability, efficiency and time-to-market for plants and processes with innovative, integrated technologies across the entire lifecycle. With a deep understanding of individual market segments, Siemens helps customers respond

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quickly and confidently to new market requirements and challenges, strengthening their competitiveness. The business is headquartered in Alpharetta, Ga., just 40 minutes north of Atlanta.

There are also key locations and manufacturing sites in Elgin, Ill.; Broussard, La.; Cincinnati, Ohio; Bartlesville, Okla.; Houston and Arlington, Texas; New Kensington, Spring House and Pittsburgh, Pa.; and Rothschild, Wis.

## ***Examples of major business:***

- Did you know that the largest recycled containerboard mill in North America can be run from a mobile device? Siemens helped Greenpac Mill LLC, a Cascades Inc. affiliate, to realize its vision for the digital future of papermaking. Greenpac's new 250,000-square-foot, \$470 million mill in Niagara Falls, N.Y. employs fully-integrated Siemens solutions for electrification, automation and digitalization from fiber through converting.
- E-Power, operator of a heavy fuel oil power plant in Cité Soleil, Haiti, realized it needed to upgrade its plant's control system to maintain the facility's reliability and provide stable electricity delivery. Prism Systems Inc., a system integrator, assisted E-Power with its software and controls upgrade of Siemens solutions, including Simatic PCS 7, Version 8.1. The facility provides 35% of Port-au-Prince's total power. Beyond supplying power to the area, E-Power has helped support and encourage investment in Cité Soleil, a traditionally impoverished city as well as help support education in the area.
- Four Roses Bourbon has been a favorite among whiskey lovers since the 1880s. When the time came to upgrade its Lawrenceburg distillery, the company needed to ensure no productivity losses, nor quality issues. Four Roses selected Siemens PCS 7 (process control system), which provided more information, easier access to information, data transparency and better connectivity to manage distillery processes.
- Siemens provided Notre Dame Turbomachinery Facility with a 5 Megawatt Norwood Motor and 10 Megawatt Variable Frequency Drive, isolation transformer and associated MV Switchgear. The new \$36 million project is the nation's foremost research and test facility for advancing the technology used in the massive gas turbine engines used by commercial and military aircraft, power plants and the oil and gas industry.

## **HEALTHINEERS**

Siemens Healthineers is committed to becoming the trusted partner of healthcare providers worldwide, enabling them to improve patient outcomes while reducing costs. Driven by our long legacy of engineering excellence and our pioneering approach to developing the latest advancements, we are a global leader in medical imaging, laboratory diagnostics, clinical IT, and services. Siemens Healthineers is dedicated to helping our partners be successful – clinically, operationally and financially – across the continuum of patient care.

With North American Headquarters in Malvern, Pennsylvania, Siemens Healthineers also has significant operations in Hoffman Estates, Ill., Knoxville, Tenn., Tarrytown, N.Y., Walpole, Mass., and Mountain View, Calif.

## ***Examples of major business:***

- Siemens Healthineers announced it will significantly invest around \$300 million in its Walpole, Mass. laboratory diagnostics manufacturing and research and development facility. The company plans to upgrade and expand its existing 500,000 square foot complex. The expansion—which will include manufacturing, warehouse, office and lab space—is set to begin in the summer of 2017.

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- IBM and Siemens Healthineers announced a five-year, global strategic alliance in Population Health Management (PHM) that aims to help hospitals, health systems, integrated delivery networks, and other providers deliver value-based care to patients with complex, chronic and costly conditions such as heart disease and cancer. The health-focused alliance is the first of its kind for the companies and marks the entry of Siemens Healthineers into PHM. Siemens Healthineers and IBM Watson Health intend to help healthcare professionals navigate unprecedented changes propelled by a growing volume and diversity of health data, an aging global population, increasing prevalence of chronic diseases, changes in healthcare payment models, and the digitization and consumerization of healthcare.
- In November 2016, Siemens Healthineers announced the launch of the CE-marked Atellica COAG 360 System, a fully automated high-volume coagulation analyzer designed to streamline and unify hemostasis testing. The Atellica COAG 360 System is the first analyzer to unify five methodologies on one testing platform—clotting (optical and optomechanical), chromogenic, immunologic, high-sensitivity luminescence based immunoassay (LOCI) technology, and platelet aggregation testing. This unification enables laboratories to potentially replace up to three stand-alone systems with just one analyzer, saving space, simplifying inventory management and reducing maintenance—reducing the overall cost of ownership.
- The FDA granted Siemens Healthcare Diagnostics Inc. (Siemens Healthineers) an Emergency Use Authorization (EUA) for its real-time PCR Zika Virus assay, the VERSANT® Zika RNA 1.0 Assay (kPCR) Kit. With respect to Zika in vitro diagnostic tests, the FDA was authorized to issue EUAs to allow for use of unapproved medical products or unapproved uses of approved medical products when, among other circumstances, there are no adequate, approved, and available alternatives and certain additional criteria are met. The VERSANT® Zika RNA 1.0 Assay (kPCR) Kit is capable of detecting the presence of Zika virus, which can be an earlier indicator of Zika virus infection than anti-Zika antibodies. The molecular test is validated for plasma, serum, and urine (collected alongside a patient-matched serum or plasma specimen) from individuals meeting CDC Zika virus clinical criteria and/or CDC Zika virus epidemiological criteria, and is designed to run on the Siemens VERSANT® kPCR Sample Prep automated platform, along with several commercially available thermal cyclers.
- Siemens Healthineers received 510(k) clearance for the SOMATOM Drive computed tomography (CT) system, a dual source scanner designed to drive precision in diagnostic imaging across a wide range of clinical disciplines – from pediatrics and emergency medicine to cardiology and oncology – as well as deliver a new level of quality in patient care with the potential to reduce examination time, preparation, and follow-up care.
- Siemens Healthineers received 510(k) clearance from the FDA for the SOMATOM Confidence RT Pro computed tomography (CT) scanner, with features dedicated to radiation therapy (RT) planning. The dedicated CT scanner delivers RT images that enable precise contouring and personalized dose calculation while eliminating unnecessary workflow steps.
- Siemens Healthineers received 510(k) clearance for two features added to its established PURE platform to simplify the adoption and utilization of advanced features on the company's Artis zee, Artis Q, and Artis Q.zen angiography systems. Aiding clinicians in endovascular aneurysm repair (EVAR), *syngo* EVAR Guidance offers automated detection of vessel walls on computed tomography (CT) datasets as well as automatic placement of landmarks for 3D image guidance. Additionally, *syngo* EVAR Guidance suggests the optimal angulation of C-arms for precise deployment. Enabling better treatment of highly challenging chronic total occlusions (CTOs), *syngo* CTO Guidance automatically segments coronary CT angiography (CTA) images in addition to providing procedural guidance.
- The FDA cleared the noninvasive SEEit prostate magnetic resonance imaging solution from Siemens Healthineers, which enables users of the company's MAGNETOM Aera 1.5T and

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MAGNETOM Skyra 3T MRI systems to perform a routine prostate exam in just 10 minutes without using an endorectal coil, which can cause patient discomfort.

## SIEMENS FINANCIAL SERVICES

Siemens Financial Services, Inc. (SFS) is the U.S. arm of Siemens' Financial Services division, an international provider of business-to-business financial solutions. SFS helps facilitate investments, providing commercial finance, project and structured finance, and corporate finance with specific asset expertise in the energy, healthcare, industry, and infrastructure markets. SFS supports Siemens, as well as other companies, with capital needs and acts as an expert manager of financial risks within Siemens. With financing expertise and industrial know-how, SFS creates value for customers and helps strengthen their competitiveness. As of September, 30, 2015, the total, global SFS assets amount to \$27.2 billion.

### *Examples of major business:*

- Apex Clean Energy sought financing support for the construction of Kay Wind, an onshore wind facility located in Kay County, Oklahoma. SFS committed to fund up to \$80 million of the project's construction financing. The 299-MW project is expected to create enough clean energy to power approximately 100,000 average U.S. homes annually. This project also features 130 Siemens SWT 2.3-108 wind turbines.
- Community Health Systems, Inc. (CHS) sought to acquire Health Management Associates to become the largest hospital operator in the U.S. SFS participated at the Co-Manager level, committing \$105 million to the credit facility. This commitment contributed to the purchase, refinanced existing debt, and provided for future working capital needs that enabled CHS to support its largest acquisition to date. This financial investment provided CHS with increased economies of scale and further growth to have an improved healthcare network.
- Siemens Financial Services is also involved in energy savings performance contracting. SFS financed energy-saving measures at the Mercedes-Benz Superdome in New Orleans with a \$7 million municipal lease. This was the first financial project structure of its kind in the state of Louisiana. At the stadium, which has hosted seven NFL Super Bowl events in its 41-year history, Siemens Building Technologies installed state-of-the-art LED lighting, new cooling systems and building management software. The operator, the Louisiana Stadium and Exposition District, is expected to save an estimated \$6.5 million in power and operating costs over ten years.
- A longstanding Siemens' customer, Panda Power Funds, sought financial support to help invest in the 1,124 MW Hummel Station power plant located in Snyder County, PA. Scheduled to become operational in early 2018, the natural gas-fueled facility will supply power for more than one million households in large power markets in the Mid-Atlantic region, including Philadelphia and New York City. Partnering with Siemens Energy, SFS contributed a \$125 million equity investment in the project. SFS has participated in all seven of the recent Panda Power Funds projects, which also involved Siemens equipment and service, including facilities in Texas, Pennsylvania, and Virginia. For more information on SFS' work with Panda Power Funds, please refer here.
- A Siemens Financial Services' financing package supported the acquisition of the new Siemens SOMATOM Perspective CT scanner for Pueblo Radiology Medical Group. This financing solution supported a long-standing customer relationship, in which Siemens has provided over \$9 million in equipment and construction financing to the Santa Barbara-based medical imaging specialist since 2001. This joint partnership served to further improve patient care with health services, and enabled Pueblo Radiology to acquire one of the most economical CT scanners on the market.

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## SIEMENS GOVERNMENT TECHNOLOGIES

A separately incorporated, independent, yet affiliated, U.S. company, Siemens Government Technologies, Inc. (SGT) is a channel to the U.S. federal government to access the full spectrum of Siemens' trusted and recognized solutions, products and services.

Examples of major business:

*Notable 2016 ESPC wins by Siemens include:*

- An award by the US Army Garrison Hawaii that will provide energy saving improvements that will generate almost \$3 million in annual cost savings to four bases in Hawaii.
- An award from the National Park Service (NPS) continues Siemens' energy and water conservation measures at national parks in the Washington, D.C. area. This second award builds on a \$29 million contract Siemens signed in 2014 that has already helped the NPS achieve annual savings of \$2 million in taxpayer dollars, 77 million gallons of water, 4,000 tons of CO2 emissions and nearly 6.5 million kwh of electricity.
- An award at the Bruceton, Pa. campus of the National Institute for Occupational Safety and Health (NIOSH), a sub-department of the Centers for Disease Control and Prevention, will reduce campus energy usage by 54 percent and water usage by 63 percent.
- An award with the U.S. Army Corps of Engineers will provide energy conservation measures such as boiler upgrades at the McAlester Army Ammunition Plant in McAlester, Okla.
- Two modifications to an existing Siemens' ESPC with the Corpus Christi Army Depot (CCAD) will address water and energy infrastructure needs and improve energy efficiency at the Pentagon's largest helicopter repair facility.

### *Installing Environmentally Friendly Hydroelectric Solutions*

- Siemens will install power generator step-up (GSU) transformers for the Bureau of Reclamation at Davis Dam on the Colorado River and for the Army Corps of Engineers at Fort Peck on the Missouri River in Montana, helping to generate clean and reliable power.

### *Siemens Helping to Improve Reliability and Extend Service Life of U.S. Navy Oilers*

- Siemens won the opportunity to modernize two additional U.S. Navy oilers in 2017 following successful modernization of the shaft generator control systems on two oilers in 2016. These modernization projects will improve their operations, reliability and efficiency.

### *SGT Dresser-Rand Integration Showing Results*

- The Wellsville, NY facility produces steam turbines for the global energy and power generation industry and the U.S. Navy. Siemens was awarded a contract to provide new low-pressure air compressors (LPACs) on the USS FORT LAUDERDALE.
- SGT D-R was awarded over \$5 million from the U.S. Department of Energy's Water Power R&D program to develop a 1MW HydroAir turbine.

## SIEMENS CORPORATE TECHNOLOGY

Corporate Technology shapes the future with a passion for research, technology and innovation.

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As a guidance provider, CT shapes Siemens' technology and innovation strategy, fosters business excellence at the company, monitors the operating units' innovative power and assesses disruptive changes in its core markets. As a partner at "eyes level," CT works closely with leading universities and institutes and makes new technologies and cross-domain applications available. As an internal service provider, CT supports the Siemens units with research and development services, protects intellectual property rights, and offers advice on improving processes and business practices.

Examples of major business:

- CT's Princeton, New Jersey site (founded in 1977) is Siemens' largest research and development center outside Europe. At this site, CT employees were honored by the Research & Development Council of New Jersey with the coveted Thomas Edison Patent Award and several Siemens Inventor of the Year awards, among others.
- Its Future Automation Lab serves as an Industry 4.0 test bed, pioneering innovations for industry.
- Siemens unveiled major renovations at its U.S. CT facility, modernizing and expanding the world-class research and development facility. The site now includes new, state-of-the-art labs that allow researchers to develop high-impact innovations to help CT's customers enhance their competitiveness.
- CT is home to hundreds of research scientists, engineers, consultants, and experts who provide technology solutions for Siemens businesses and work closely with Siemens' customers, government agencies, universities, and other organizations.

## DRIVING INNOVATION

In October 2016, Siemens set up of a separate unit to foster disruptive ideas more vigorously and to accelerate the development of new technologies.

The unit's name, "next47," plays on the fact that Siemens was founded in 1847. The new unit has funding of \$1 billion for the first five years and will build on Siemens' existing startup activities. Independent but able to leverage the advantages offered by Siemens, next47 has offices in Berkeley, Shanghai and Munich and covers all regions of the world from those locations. It is open to employees as well as to founders, external startups and established companies that want to pursue business ideas in the company's strategic innovation fields.

## DRIVING SUSTAINABILITY

Siemens is committed to acting in the best interest of future generations – with respect to the **economy**, the **environment**, and **society**.

Before the announcement of the global climate agreement in Paris in 2015, Siemens announced a bold objective: **to cut its greenhouse gas emissions in half by 2020 and to become carbon neutral by 2030.**

To achieve this decarbonization, Siemens is focusing on four different areas. First, its Energy Efficiency Program (EEP) is verifiably reducing energy consumption at the company's own buildings and manufacturing facilities. Second, increased use of distributed energy systems (DES) is optimizing energy costs at the company's locations and production plants. Third, Siemens is systematically employing low-emission vehicles and e-mobility concepts in its worldwide vehicle fleet. Fourth, the company is moving toward a clean energy mix by increasingly acquiring its electricity from sources that emit little or no CO<sub>2</sub> – such as wind power and hydroelectric power.

Over the next three years, Siemens plans to invest more than \$110 million to improve energy efficiency at offices and factories, and will require Leadership in Energy and Environmental Design (LEED)



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certification for all of the company's new buildings.

Siemens has already made significant advances in reducing its carbon footprint. The company has cut its CO<sub>2</sub> emissions from **2.2 million tons in fiscal 2014 to 1.7 million tons in fiscal 2016.**

Siemens is also installing distributed and renewable-energy systems at a number of its facilities. As a model, the company will look to its rail manufacturing plant in Sacramento, Calif., where about 80 percent of total electricity is generated using solar energy.

Siemens expects these investments to pay for themselves in just five years and generate \$20 million in annual savings thereafter – demonstrating that cutting your carbon footprint is good business as well as good corporate citizenship.

Siemens' carbon neutral announcement is an extension of the company's long-standing commitment to applying the principles of sustainability across its value chain – designing sustainable products and solutions for industrial, commercial, municipal and institutional customers. Siemens' portfolio includes fuel efficient gas turbines, high-speed electric locomotives, digital grids, wind turbines, optimized drive technologies for manufacturers, resource-saving building automation, and energy efficient health care equipment.

With these and other technologies, in the last fiscal year Siemens' environmental portfolio enabled its customers and partners throughout the world to reduce their carbon dioxide emissions by 487 million tons – about ten times the annual amount of carbon produced in New York City.

In January 2017, Siemens was named the most sustainable company in the world by Corporate Knights.

Sustainability guides Siemens' over-arching commitment to thinking and acting in the interest of future generations – balancing people, planet and profit.

## **SIEMENS VETERANS INITIATIVES**

Since 2011, Siemens has hired over 2,500 veterans. In March 2017, Siemens committed to hiring a **minimum of 300 U.S. military veterans per year for the next three years**, providing them with additional skills training to make them successful at performing roles at Siemens' various U.S. facilities.

Over 60 percent of veterans at Siemens work in STEM-related disciplines, which meet a critical need for the company's workforce' and to the U.S. workforce in general.

Siemens also earned the 2017 Military Friendly Employer designation by Victory Media, publisher of *G/ Jobs* and *Military Spouse* magazines.

Siemens also offers job training for U.S. military veterans with an engineering and manufacturing background as part of a national effort to assist veterans transitioning to the civilian workforce. The program, launched by Siemens product lifecycle management (PLM) software business in cities across the country, provides free training in the use of state-of-the-art digital lifecycle management and computer-aided design (CAD), computer-aided manufacturing (CAM) and computer-aided engineering (CAE) software technology. Through this effort, Siemens will invest up to \$17,000 per eligible veteran for access to training that will help enhance veterans' qualifications for skilled positions in a wide variety of manufacturing industries around the world, including automotive, aerospace, energy, high-tech electronics, and machinery. Upon completion of the training, veterans who participate in this initiative can also present themselves as qualified candidates for positions with Siemens or the 140,000 customers who use Siemens' PLM technology.

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## THE SIEMENS FOUNDATION

The Siemens Foundation has invested more than \$100 million in the U.S. to advance workforce development and education initiatives in science, technology, engineering and math. Its signature programs include the Siemens Competition in Math, Science & Technology, the premier STEM research competition for high school students, as well as national partnerships with organizations such as the Aspen Institute, the National Governors Association, New America and Advance CTE to raise the perception of middle-skill employment opportunity and scale proven models for middle-skill STEM education. The Siemens Foundation's mission is inspired by a culture of innovation, research and continuous learning that is the hallmark of Siemens. Together, the programs at the Siemens Foundation are closing the opportunity gap for young people in the U.S. when it comes to STEM careers, and igniting and sustaining today's STEM workforce and tomorrow's scientists and engineers.

## RANKINGS & RECOGNITION

- Siemens was ranked #1 on *Fortune's* World's Most Admired Companies list in the industrial machinery category.
- Siemens was ranked #21 on *Fortune's* Companies that are Changing the World list.
- In 2017, Siemens was named the world's most sustainable company by Corporate Knights.
- The Dow Jones Sustainability Index named Siemens as one of the most sustainable companies in its industry. For the 17<sup>th</sup> time in a row, Siemens was included in the DJSI World Index list, receiving a positive overall assessment by scoring 89 out of a maximum of 100 points.
- In 2016, Siemens was ranked #8 as the World's Most Attractive Employers, among engineering and IT students.
- In 2016, Siemens landed the 52<sup>nd</sup> spot on Interbrand's "Best Global Brands" list.
- In 2016, Siemens was recognized by the readers of Diversity / Careers in Engineering and Information Technology as a **Best Diversity Company**. Siemens has also been recognized as a **Top Fifty Company** for diversity by readers of *Woman Engineer* magazine.
- In 2016, Siemens was selected for the 14th straight year as a **Top Supporter of Historically Black Colleges and Universities (HBCUs)** by the deans of the 14 ABET accredited, HBCU engineering programs and the corporate-academic alliance Advancing Minorities' Interest in Engineering (AMIE).
- Siemens was listed as a **Top Employer** for the following majors by *The Black Collegian* magazine: Mechanical Engineering, Industrial Engineering, Electrical Engineering, IT / MIS, Accounting / MIS and HR.
- Siemens has earned the 2017 Military Friendly Employer designation by Victory Media, publisher of *GI Jobs* and *Military Spouse* magazines.
- Siemens was recognized with the 2016 Employer Support of the Guard and Reserve Patriot Award.

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